

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1-22. (cancelled)

23. (Previously Presented) A balloon catheter, comprising:

an outer tubular member having a distal end region;

an inner tubular member disposed within the outer tubular member, the inner tubular member having a distal end region that extends distally from the distal end region of the outer tubular member;

a balloon having a proximal portion and a distal portion, the proximal portion being attached to the distal end region of the outer tubular member and the distal portion being attached to the distal end region of the inner tubular member;

wherein the distal portion of the balloon defines a distal waist having a distal waist length; and

a tie layer defined by a heat shrink tubular member that is disposed between the distal waist of the balloon and the distal end region of the inner tubular member, the heat shrink tubular member being heat shrunk to the inner tubular member and being thermally bonded to the distal waist of the balloon, the tie layer having a length that is substantially the same as the distal waist length.

24. (Previously Presented) The balloon catheter of claim 23, wherein the tie layer includes low density polyethylene.

25. (Previously Presented) The balloon catheter of claim 23, wherein the tie layer is heat-shrunk onto the inner tubular member.

26. (Previously Presented) The balloon catheter of claim 23, wherein the tie layer is multi-layered.

27. (Previously Presented) The balloon catheter of claim 23, wherein the inner tubular member includes polyethylene and wherein the tie layer has a relatively high bonding affinity for polyethylene.

28. (Previously Presented) The balloon catheter of claim 23, wherein the inner tubular member includes polytetrafluoroethylene and wherein the tie layer has a relatively high bonding affinity for polytetrafluoroethylene.

29. (Previously Presented) A balloon catheter, comprising:
a first tubular member having a distal end region;
a second tubular member disposed within the first tubular member, the second tubular member having a distal end region that extends distally from the distal end region of the first tubular member;
a balloon having a proximal portion and a distal portion, the proximal portion being attached to the distal end region of the first tubular member and the distal portion being attached to the distal end region of the second tubular member;
wherein the distal portion of the balloon defines a distal waist having a distal waist length; and
a tie layer insert disposed between and thermally bonded to both the distal waist of the balloon and the distal end region of the second tubular member, the tie layer insert having a length that is substantially the same as the distal waist length.

30. (Previously Presented) The balloon catheter of claim 29, wherein the tie layer insert includes low density polyethylene.

31. (Previously Presented) The balloon catheter of claim 29, wherein the tie layer insert is heat-shrunk onto the second tubular member.

32. (Previously Presented) The balloon catheter of claim 29, wherein the tie layer insert includes a plurality of layers.

33. (Previously Presented) The balloon catheter of claim 29, wherein the second tubular member includes polyethylene and wherein the tie layer has a relatively high bonding affinity for polyethylene.

34. (Previously Presented) The balloon catheter of claim 29, wherein the second tubular member includes polytetrafluoroethylene and wherein the tie layer has a relatively high bonding affinity for polytetrafluoroethylene.

35. (Previously Presented) A balloon catheter, comprising:
an outer tubular member having a distal end region;
an inner tubular member disposed within the outer tubular member, the inner tubular member having a distal end region that extends distally from the distal end region of the outer tubular member;
a balloon having a proximal portion and a distal portion having a length, the proximal portion being attached to the distal end region of the outer tubular member and the distal portion being attached to the distal end region of the inner tubular member; and
a multi-layer insert disposed between the distal portion of the balloon and the distal end region of the inner tubular member, the multi-layer insert having a length that is substantially the same as the length of the distal portion of the balloon.

36. (Previously Presented) A method for bonding a balloon to a catheter shaft, the method comprising the steps of:

providing a catheter shaft, the catheter shaft including an outer tubular member with a distal end region and an inner tubular member disposed within the outer tubular member, the inner tubular member having a distal end region that extends distally from the distal end region of the outer tubular member;

providing a tie layer having a length;

thermally bonding the tie layer onto a portion of the distal end region of the inner tubular member;

providing a balloon having a proximal waist, a distal waist, and an expandable region therebetween, the distal waist having a length that is substantially the same as the length of the tie layer; and

affixing the distal waist of the balloon to tie layer.

37. (Previously Presented) The method of claim 36, wherein the step of thermally bonding the tie layer onto a portion of the distal end region of the inner tubular member includes heat shrinking the tie layer onto a portion of the distal end region of the inner tubular member.

38. (Previously Presented) The method of claim 36, wherein the step of affixing the distal waist of the balloon to tie layer includes thermally bonding the distal waist of the balloon to the tie layer.